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Determinants of community pharmacy utilization in Ghana

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Abstract

Objective To examine the determinants of community pharmacy utilization and factors influencing an individual's decision to use community pharmacy as first option for primary care services.

Method A cross-sectional household survey was conducted in the Ga West district of Ghana. A total of 497 adults (18 years and above) were chosen using a three-stage cluster random sampling technique. Probit regression models were used to estimate the determinants of use of community pharmacy in general, and use of community pharmacy as first option for primary care services.

Key findings Out of 497 respondents, 415 indicated that they had used community pharmacies within the last 12 months prior to the study, while 82 indicated that they had not used community pharmacies within the same time frame. The regression results revealed that utilization of community pharmacy services was influenced by age, presence of minor ailment, distance to the nearest pharmacy, employment status, income, location and perceptions concerning pharmacists' roles. Additionally, factors influencing an individual's decision to use community pharmacy services as first option for primary care services were found to include perceptions concerning pharmacists' role, privacy, distance and waiting time.

Conclusion The findings of the study have significant implications for policy formulation, aimed at improving community pharmacy services utilization and consequently improving the quality of services offered, both in community pharmacies and mainstream hospitals.

Keywords community pharmacy; determinants; minor ailments; utilization

Introduction

Community pharmacies are an integral part of primary healthcare services in any healthcare system and are often close to users, especially in urban communities.[1] Additionally, pharmacies have long opening hours, do not require an appointment for consultation and are more accessible than other healthcare facilities.[2] Pharmacies are recognized for providing varying services which include provision of drug information, clinical interventions, review of medications, health screening, treatment of minor ailments, provision of medicine and non-medicine treatments as well as documenting and preventing adverse drug reactions to the public.[3,4]

The relative ease of access to community pharmacies makes them well positioned to provide healthcare advice to all categories of people.[1] In addition, high administrative charges related to clinical consultations in hospitals make community pharmacy visits relatively affordable and preferred by the general public in many urban areas, especially in developing countries such as Ghana.[5] Furthermore, community pharmacies have convenient hours of operation and provide services to clients with minimal waiting time.[6] Using community pharmacies as the first port of call for the treatment of minor ailments helps optimize healthcare resources by reducing the demand for more costly healthcare options such as appointments with general practitioners (GPs).[7,8]

Several studies carried out on utilization of community pharmacies in developed countries explored reasons for the use of pharmacies and experience encountered[9,10]; attitudes and perceptions towards pharmacy services[11–14] and also use of pharmacy and GPs in primary healthcare settings.[15,16] Evidence from these studies suggests that many

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people prefer to use GPs for primary care services (such as advice and treatment of minor ailments, advice on general health conditions and management and use of medications) that are also provided in community pharmacies. Only a few of the studies conducted in developed countries examined factors influencing user choice for community pharmacy services.[17–20]

Unlike developed countries, the community pharmacy utilization literature in developing countries, especially sub-Saharan Africa (SSA) is scanty with mixed results.[21–25] The few studies available in SSA[22,23] have focused on the views of users of pharmacy services and perceptions of roles of community pharmacists, with limited attention to factors influencing an individual's decision to use a community pharmacy. Additionally, little is known in the existing literature on factors that influence the decision of users to use community pharmacies as the first option for primary care services when seeking care. In Ghana, many pharmacies are located in the Greater Accra and Ashanti regions,[26] with more facilities springing up each year. Yet, there is hardly any published work on the determinants of community pharmacy utilization in the Ghanaian healthcare literature. The current study therefore examines the determinants of community pharmacy utilization and factors influencing the use of a community pharmacy as a first option for primary care services using household data from the Ga West district of the Greater Accra region of Ghana.

Methods

Data source

The target population constitute adults (18 years and above) living in households in the Ga West district, which according to the 2010 Ghana population and housing census has 330 Enumeration Areas (EAs).[27] Children were omitted from the study because they are unlikely to either make decisions concerning their health or have the capacity to give consent for the purpose of collecting data. To ensure that the data collected is representative and statistics calculated can approximate parameters of the population, a three-stage cluster random sampling procedure was used to obtain the sample for the study. In the first stage, the total number of EAs was divided into three groups based on the types of EAs available in the district. A total of 50 EAs (deemed to be adequate, based on the size of the EAs) were sampled from the three groups using probability proportional to the size of each of the groups. Thereafter, a listing of all households in the sampled EAs was carried out, which subsequently served as the sampling frame for the second stage. In the second stage, 10 households were randomly sampled from each of the selected EAs. Finally, one member of the household aged 18 years and above in each of the selected households was randomly selected and interviewed.

In all, 497 households were covered in the study. This is because, in a particular EA, only seven households were listed, because a large section of the EA had become a commercial area. In addition, residents of some of the selected households were reluctant to participate in the study. Ethical approval for the study was granted by the Ethics Committee of the Humanities in the University of Ghana. Also, an approval letter was obtained from the Ga West Municipal Assembly to conduct the study in the district. The aim of the study was explained to all participants and a written consent form was completed by respondents before answering the questionnaire. Prior to the data collection, five enumerators who were fluent in English, Twi, Dangme, Ewe and Ga (the predominant dialects in the study area) were trained for about 6 h on the procedures for data collection. The training focused on helping enumerators to understand (1) all facets of the questionnaire as well as how to ask each question and (2) rephrasing of certain questions during data collection and identifying local names for certain items that needs translation in the local language. The data were collected using a Computer-Assisted Personal Interviews (CAPI) technology. The use of the CAPI meant that data collected by enumerators was received electronically on real-time and thereby eliminating potential errors and delays associated with manual collection of data. The questionnaire used for the study was adapted from previous literature sources.[11,14,28,29]

Variable definition

The two dependent variables of interest are 'use of pharmacy' and 'use of pharmacy as a first option for primary care services'. These variables are defined as follows:

- Use of pharmacy: This is coded as 1 if a respondent used community pharmacy, within the 12 months prior to the survey and 0 if otherwise. The use of the 12 months is on the basis that it is neither too short to establish a behaviour pattern for respondents, or too long for respondents to have recall difficulties.
- Use of pharmacy as first option for primary services (advice and treatment of minor ailments, advice on general health conditions and management and use of medications): This is coded as 1 if a respondent used community pharmacy as the first option for primary services within the 12 months prior to the survey and 0 if otherwise.

Consistent with the existing literature, several independent variables at the individual level (age, gender, educational level, perception of the role of the pharmacist, presence of minor ailments), household level (religion, employment, asset index) and community level (distance to the pharmacy, type of location, waiting time, privacy in pharmacies) were used.[17,18,23,30,31] The definition and measurement of the independent variables are contained in Table 1 below. An asset index was calculated using questions on ownership of household assets. The method of principal component analysis was used to derive weights, based on which the first principal component (captures maximum variation in the assets used) was calculated, standardized and used as the asset index.

The rationale for assessing waiting time and privacy for only pharmacy users is that users have experienced care in community pharmacies and are conversant with how services are provided. Hence, they can accurately report on these variables. The variable 'Perception of the role of Pharmacists' was based on five questions, measured on a 5-

Table 1 Socio-economic characteristics of respondents

Variables	Users			Non-users		
	Obs.	Mean	SD	Obs.	Mean	SD
Gender						
Male (1)	415	0.39	0.49	82	0.5	0.5
Female (0 = base)	415	0.61	0.49	82	0.5	0.5
Age	415	40.18	13.2	82	41.2	12.8
Religion						
Christian (1)	415	0.89	0.31	82	0.90	0.30
Other religions (0 = base)	415	0.11	0.31	82	0.10	0.30
Educational level						
None (1 = base)	415	0.11	0.31	82	0.15	0.36
Primary (2)	415	0.15	0.36	82	0.18	0.39
Secondary (3)	415	0.65	0.48	82	0.60	0.49
Tertiary (4)	415	0.09	0.29	82	0.07	0.26
Employment status						
Employed (1)	415	0.93	0.26	82	0.89	0.31
Unemployed (0 = base)	415	0.07	0.26	82	0.11	0.31
Location type						
Urban (1)	415	0.75	0.44	82	0.70	0.47
Rural (0 = base)	415	0.25	0.44	82	0.30	0.47
Insurance status						
Yes (1)	415	0.61	0.49	82	0.40	0.49
No (0 = base)	415	0.39	0.49	82	0.60	0.49
Minor ailments						
Yes (1)	415	0.83	0.38	82	0.09	0.28
No (0 = base)	415	0.17	0.38	82	0.91	0.28
Perceptions of pharmacists roles						
Neutral perception (1 = base)	415	0.50	0.50	82	0.24	0.43
Positive perception (2)	415	0.41	0.49	82	0.65	0.48
Negative perception (3)	415	0.09	0.29	82	0.11	0.31
Distance to pharmacy (km)	415	0.5	2.5	82	1.0	1.9
Asset index	415	1.37	0.54	82	1.14	0.61
Waiting time (min)	415	6.86	6.74	ND	ND	ND
Privacy in the pharmacy						
Concerned about privacy (1)	415	0.27	0.44	ND	ND	ND
Unconcerned about privacy (0 = base)	415	0.73	0.44	ND	ND	ND

Source: constructed by authors based on field data.

point Likert scale, where strongly agree = 1, agree = 2, neutral = 3, disagree = 4 and strongly disagree = 5 (see Table 2). The five questions were aggregated into a single variable for each respondent by recoding strongly agree and agree as 1, and labelled as positive perception, neutral as 2, and labelled as neutral perception and disagree and strongly disagree as 3 and labelled as negative perception.

Estimation strategy

The data collected were cleaned, checked for errors and analyzed using STATA (version 14.0; STATA Corporation, Chicago, IL, USA). First, frequencies and percentages of the variables used were calculated.

Given that the two response variables were in a binary form, the probability that a respondent used a community pharmacy, or used a community pharmacy as the first option for primary care services in the last 12 months prior to the survey, can be modelled as in Equation below:

$$\Pr(V_j = 1) = \Pr(X_j\beta + \varepsilon_j > 0)$$

where j is the alternative of using or not using (use of a community pharmacy or use of a community pharmacy as a first option for primary care services) and V, an indirect utility derived from choosing any of the two alternatives arising from each of the two outcome variables. For example, $V = 1$ represents where a community pharmacy is used, or a community pharmacy is used as the first option for primary care services or otherwise if $V = 0$. X represents a vector of explanatory variables at the individual, household and community level (see Table 1), and β are coefficients to be estimated and ε is the error term.

Table 2 Probit regression of factors influencing decision to use the pharmacy

Variable	dy/d*x*	Std error	$P > \|z\|$
Male	−0.0234	0.0304	0.442
Age	−0.0021	0.0011	0.056*
Educational level			
Primary	−0.0080	0.0420	0.848
Secondary	0.0272	0.0397	0.493
Tertiary	0.0188	0.0661	0.775
Location (Urban = 1)	0.0550	0.0288	0.056*
Minor ailment (yes = 1)	0.3257	0.0167	0.000***
Insurance status(yes = 1)	0.0388	0.0263	0.140
Distance	−0.0073	0.0030	0.015**
Religion (Christian = 1)	−0.0514	0.0333	0.123
Employment status(employed = 1)	0.1106	0.0462	0.017**
Asset index	0.0198	0.0099	0.045**
Perceptions concerning pharmacists role			
Positive perceptions	0.0319	0.0285	0.263
Negative perceptions	−0.0715	0.0371	0.054*
Number of obs = 497			
Wald chi^2 (14) = 97.81			
Prob > chi^2 = 0.0000			
Pseudo R^2 = 0.4687			
Log pseudo-likelihood = −118.2629			

Source: Constructed by authors based on field data.
***Significant at 1%; **Significant at 5%; *Significant at 10%.

Results

Socio-economic characteristics for respondents

The socio-economic characteristics of respondents are captured in Table 1. Out of the 497 respondents, 415 indicated that they had used pharmacies within the last 12 months prior to the study; hence, they were considered users of community pharmacy services. The remaining who had not

used the services of any pharmacy within the same time frame were considered as non-users. Majority of the pharmacy users (89%) and non-users (90%) were Christian whilst the remaining belonged to other religions. Most of the respondents were educated to secondary level (65% and 60% for users and non-users respectively). A greater proportion of the sampled respondents were employed, enrolled on a health insurance scheme and also lived in urban areas. Equally, a large number of pharmacy users (83%) pointed out that they had suffered some form of minor ailments, within 12 months prior to the study.

The mean distance to the nearest pharmacy was 0.5 km for users and 1 km for non-users of pharmacy services. Also, the average waiting time in the pharmacy for pharmacy users was 6.9 min and majority of pharmacy users (73%) indicated that lack of privacy in the pharmacy will not deter them from using the pharmacy for the treatment of minor ailments whilst the remaining indicated otherwise.

Determinants of community pharmacy services utilization

A probit model using a robust covariance matrix was used to estimate the determinants of an individual's decision to use a community pharmacy. The use of the robust covariance matrix was to ensure that estimated coefficients were efficient and unbiased. The results of the probit model in Table 2 reports the marginal effect estimates. The results suggests that whilst living in an urban area, being employed, the presence of minor ailments and household assets are significantly positively correlated with the use of community pharmacies, age, distance to the pharmacy and negative perceptions of the role of the pharmacist are significantly negatively correlated with the use of community pharmacies.

Factors influencing the use of community pharmacy as first option for primary care services

Additionally, a probit model based on a robust covariance matrix was used to estimate the determinants of use of a community pharmacy as a first option for primary care services. As in the case of Table 2, the results in Table 3 are marginal effects, calculated from the probability estimates. The results in Table 3 suggest that whilst waiting time, distance, privacy and positive perception of the role of the pharmacist are significantly positively correlated with the use of a community pharmacy as a first port of call for primary services, negative perception of the role of the pharmacist was found to be negatively correlated with the use of a pharmacy as a first port of call for primary care services.

Table 3 Probit regression of factors influencing the use of pharmacy as first option for primary care services

Variables	dy/d*x*	Std error	*P* > |*z*|
Male	0.0022	0.0487	0.964
Age	0.0027	0.0018	0.145
Educational level			
Primary	−0.1156	0.0920	0.209
Secondary	−0.0224	0.0769	0.770
Tertiary	−0.0841	0.1096	0.443
Location (urban = 1)	−0.0656	0.0548	0.231
Insurance (yes = 1)	0.0017	0.0476	0.972
Waiting time	0.0113	0.0040	0.005***
Religion (Christian = 1)	−0.0398	0.0666	0.550
Distance	0.0486	0.0219	0.026**
Asset index	0.0299	0.0426	0.482
Privacy (concerned = 1)	0.1040	0.0484	0.032**
Employed (yes = 1)	0.0850	0.0855	0.320
Perceptions concerning pharmacists role			
Positive perceptions	0.2681	0.0524	0.000***
Negative perceptions	−0.3737	0.0692	0.000***
Minor ailment (yes = 1)	−0.0142	0.0603	0.814
Number of obs = 415			
Wald chi^2 (16) = 82.45			
Prob > chi^2 = 0.0000			
Log pseudo-likelihood = −221.23453			
Pseudo R^2 = 0.2067			

Source: constructed by authors based on field data.
***Significant at 1%; **Significant at 5%.

Discussion

The results of the study indicate that the age of an individual negatively affects utilization of community pharmacy. It shows that an additional year to the age of an individual reduces the probability that the individual will utilize a community pharmacy by 0.20 percentage points. This contradicts findings in other jurisdictions, where it has been suggested that age increases the use of pharmacies.[32,33] The contradiction may be due to differences in the health systems of the countries involved. For example, in Britain where the two studies cited were conducted, most outpatients receive their medications from community pharmacies. On the contrary, outpatients in Ghana are more likely to receive most of their medication from pharmacies within the outpatient department of the hospital visited, given that almost all hospitals have pharmacies that serve their outpatients. Thus, on the assumption that the aged generally use more hospital-based services, because of the complicated nature of their health needs, we can argue that in Ghana, where patients visiting a hospital are more likely to be served by pharmacies within the hospital, age is more likely to be negatively correlated with the use of community pharmacies.

The finding that living in an urban area is positively associated with the use of a pharmacy is not surprising. Majority of pharmacies in Ghana are concentrated in urban centres. As already indicated, about 80% of all the pharmacies in Ghana are in the Greater Accra and Ashanti regions,[26] that are mostly urban. This means a longer average distance to a pharmacy in rural areas, thus, constraining the decision by rural dwellers to use pharmacies for healthcare services. The rural–urban variation in the use of pharmacies can also be explained by inequities in resource and infrastructure distribution

between urban and rural areas, that seem to be a major characteristic of several developing countries such as Ghana and very much documented in the existing healthcare utilization literature.[30,31,34,35]

Additionally, the presence of minor ailments was found to significantly increase the probability that an individual will use community pharmacy services compared with those who did not experience any minor ailments. This is straight forward, considering the fact that community pharmacies are largely accessible and health professionals who work there are also easily reachable. As already indicated, there is evidence in the existing literature that suggests that the presence of minor ailments is correlated with the use of a community pharmacy.[13]

Consistent with earlier studies,[36] the study suggest that the proximity of a pharmacy to an individual's home increased the likelihood that the individual will utilize pharmacy services. This may not be surprising since it is common knowledge that people patronize more health services when the facilities are close to them. On the contrary, distance to the pharmacy and waiting time are both significantly positively correlated with use of a pharmacy as first option for primary care services. This is counter-intuitive and contradicts the findings of earlier studies that suggest that increased waiting time and distance to the pharmacy are likely to reduce the probability that the pharmacy will be used as first option for primary care services.[37] The results on distance and waiting time should be interpreted with caution. This is based on the fact that the results in Table 2 suggest that distance is negatively correlated with the use of pharmacy in general. Thus, the counter-intuitive results on the coefficients of distance and waiting time may be due to the fact that using the pharmacy as first option for primary care services may be more nuanced. For example, pharmacies that may be used by respondents as first option for primary services may have unique capabilities and characteristics and therefore may not be uniformly distributed in a community. Thus, irrespective of how far they and how long users may have to wait before they are seen, they may have no option than to use those specific pharmacies, hence the counter-intuitive results.

The study also found that being employed increases the likelihood that an individual will use pharmacy services. This may be because employed persons have limited time and hence may not want to join long queues in hospitals, hence increasing the use of pharmacy services. It may also be due to the fact that being engaged in some form of work increases the availability of resources and, hence, are more able to access health services than their counterparts who are unemployed. There is a large public health literature that suggest that availability of resources, either captured by household wealth or employment is positively correlated with the use of health services.[30,31,38]

The results of the study reveal that asset index, used as a proxy for household income influences the use of community pharmacy, although the coefficient was not significant in the case of use of the pharmacy as first option for primary care services. The significant positive correlation of asset index with use of community pharmacy is consistent with the argument that higher levels of income are associated with increased use of health services. Comparable to employment, there is substantial evidence in the existing healthcare utilization literature that has consistently found a positive correlation between different proxies of income and use of health services.[30,31,34,35]

Also, results of existing studies suggest that in several instances, clients have opted for the services of a GP even when the same service is available in a pharmacy, either due to lack of awareness or a negative perception of the professional role of the community pharmacist.[15,16] Thus, the finding that negative perception of the role of the pharmacist adversely influences the use of community pharmacy in general and as first option for primary services is straight forward. There is evidence in the existing literature to suggest that negative perception of the role of the pharmacist is correlated with low utilization of certain pharmacy services.[39] In the case of use of the pharmacy as first option for primary care services, the results additionally show that positive public perception of the role of the pharmacist increases usage. For example, the probability of using a pharmacy as first option for primary care services increases by 26.8 percentage points for positive perception and reduces by 37.4 percentage points for negative perception. This is consistent with existing findings[40] that suggest that thoughts about professional limits and responsibilities influence utilization of pharmacies as a primary care resource. Thus, individuals with positive thoughts about the professional limits and responsibilities of pharmacists are more likely to use pharmacies than others with negative thoughts, which is evident in the findings of this study.

Finally, those who care about privacy had an increased probability of not using the pharmacy as the first option for primary care services compared to those who do not care about privacy. Privacy has often been a key factor that influences the decision to access service in a healthcare facility such as pharmacies.[25,41]

Conclusion

The study examined the determinants of community pharmacy utilization and factors influencing the use of pharmacy as a first option for primary care services. The results of the study suggest that age, minor ailments, distance to the nearest pharmacy, employment status, asset index, location type and perceptions of the role of pharmacists influence one's decision to utilize community pharmacy services. In addition, waiting time, distance to the nearest pharmacy, privacy and perceptions of the role of pharmacists influence the use of community pharmacies as first option for primary care services. The findings of the study can constitute a key input into policy interventions that will be essential for improving availability and accessibility to health services. As indicated earlier, community pharmacies can constitute a less expensive alternative to mainstream hospitals, especially in the treatment of minor ailments and use of primary care services. Thus, knowledge of and understanding of the determinants of use of community pharmacy in general and use of community pharmacy as the first option for primary services will be important in improving the community

pharmacy ecosystem, and consequently the use of pharmacies and reduction in congestion in hospitals. In line with the findings of the study, existing and new policies can focus on increasing the stock of pharmacies in rural areas, reducing the average distance from home to a community pharmacy, educating the public to improve their perception of community pharmacists, the length of time people spend at the pharmacy and more crucially, the issue of privacy. Addressing these issues in addition to appropriately regulating pharmacies can enhance the capacity of community pharmacies to respond to the health needs of the general public and thereby reduce the enormous traffic to mainstream hospitals, and consequently improve the quality of care. Reduction in traffic to mainstream hospitals may also mean reduced burden on general physicians to give them ample time to attend to potentially serious conditions and thereby improve the quality of care.

Declarations

Conflict of interest

The Author(s) declare(s) that they have no conflicts of interest to disclose.

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Authors' contributions

GAO GAN and POA conceptualized the paper. GAO conducted the literature review and supervised the data collection process as well as the analysis and writing of the findings. GAN and POA supervised the work and provided guidance for the literature review, data collection and analysis. GAN worked to improve the first draft with POA providing appropriate comments. All authors read and approved the final manuscript.

Ethics approval and consent to participate

Ethical approval for the study was granted by the Ethics Committee of the Humanities in the University of Ghana. Also, an approval letter was obtained from Ga West Municipal Assembly to conduct the study in the district. The aim of the study was explained to all the participants and a written consent form was completed by respondents before answering the questionnaire.

Data availability statement

The data used for the study are available and can be requested from the corresponding author upon reasonable request.

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Appendix

Table A1 Respondents perceptions of pharmacists roles

Perceptions	Responses	Users		Non-users		Overall	
		Freq.	%	Freq.	%	Freq.	%
Pharmacists' have the expertise to diagnose and provide treatment for minor ailments	Strongly agree	14	3.4	4	4.9	18	3.6
	Agree	297	71.6	39	47.6	336	67.6
	Neutral	48	11.6	23	28	71	14.3
	Disagree	55	13.3	16	19.5	71	14.3
	Strongly disagree	1	0.2	0	0	1	0.2
Pharmacists' have the knowledge to provide advice on general health conditions	Strongly agree	8	1.9	0	0	8	1.6
	Agree	235	56.6	40	48.8	275	55.3
	Neutral	120	28.9	27	32.9	147	29.6
	Disagree	51	12.3	15	18.3	66	13.3
	Strongly disagree	1	0.2	0	0	1	0.2
Pharmacists' have a good balance between health matters and making money	Strongly agree	2	0.5	0	0	2	0.4
	Agree	200	48.2	21	25.6	221	44.5
	Neutral	199	48	55	67.1	254	51.1
	Disagree	14	3.4	5	6.1	19	3.8
	Strongly disagree	0	0	1	1.2	1	0.2
Pharmacists' know a lot about drugs and are concerned about and committed to caring for the public	Strongly agree	6	1.4	0	0	6	1.2
	Agree	191	46	20	24.4	211	42.5
	Neutral	198	47.7	56	68.3	254	51.1
	Disagree	20	4.8	6	7.3	26	5.2
	Strongly disagree	0	0	0	0	0	0
Pharmacists' are more concerned with the health of patients than making money	Strongly agree	6	1.4	2	2.4	8	1.6
	Agree	173	41.7	16	19.5	189	38
	Neutral	210	50.6	57	69.5	267	53.7
	Disagree	26	6.3	7	8.5	33	6.6
	Strongly disagree	0	0	0	0	0	0

Source: Constructed by authors based on field data.